

REMARKS

The Office Action has been carefully reviewed. Reconsideration and allowance of the claims in light of the foregoing amendments and request for continued examination under 37 C.F.R. 1.114 is respectfully requested. In addition, a petition and fee for a three-month extension accompanies this response.

Claims 1-3 stand rejected under 35 U.S.C. 102(e) as being anticipated by the Cheon patent (US 6,783,569). The Office Action stated that the Cheon patent teaches a method of forming core-shell metallic nanoparticles comprising forming a dispersion of metal nanoparticles in an organic solvent, forming a solution comprising a metallic precursor and an organic solvent, adding the solution into the dispersion, and maintaining the mixed dispersion until core-shell nanoparticles are formed. See Cheon, col. 2, lines 53-63. The organic solvent is served as a reducing agent for the metallic precursor. Magnetic nanoparticles are taught as the suitable metal nanoparticles (Cheon, col. 4, lines 13-46). The metal for the metallic precursor is required to have a higher reduction potential than the metal in the metal nanoparticles (Cheon, col. 4, lines 48-52), and it's shown that gold has a higher reduction potential than chromium, iron, cobalt and nickel (Cheon, col. 4, lines 54-57). At col. 8, lines 64-68, Cheon teaches gold-coated magnetic nanoparticles of cobalt, iron, and nickel. Therefore, Cheon teaches a method of coating gold directly onto a magnetic nanoparticle core.

Claims 2-3: See Cheon, col. 4, lines 13-46.

Applicants submit that the process of claims 1 and 3 as amended is neither taught nor suggested by Cheon et al. Cheon et al. fail to teach or suggest samarium, neodymium or samarium-cobalt as magnetic materials. Additionally, Cheon specifically teaches away from the use of chemical reducing agents such as hydrides whereas the present claims 1 and 3 specifically call for a reducing agent together with a reducible gold compound to be added to the suspension. In contrast, Cheon describes prior art methods of using chemical reducing agents such as hydrides (see, col. 1, lines 53-62) and teaches the use of a transmetalation reaction to avoid the synthesis problems of the prior art by "only a metallic transmetalation reaction taking advantage of oxidation-reduction potential differences between heterogeneous metals, without any additional catalyst." (col. 2, lines 27-30) Further, Cheon states that "the object of the present

invention is to provide a method for producing core-shell type metallic nanoparticles having a stable and uniform particle size, or solid solution alloy type metallic nanoparticles having a certain composition ratio, via transmetalation reactions of various metals without any additional reducing agent, on the basis of the ionization tendencies of the substituent metal" (col. 2, lines 41-47, emphasis added).

Thus, Cheon not only fails to teach or suggest samarium, neodymium or samarium-cobalt, but Cheon specifically teaches away from the presently claimed invention by emphasizing that the invention is to avoid the use of reducing agents. Accordingly, applicants submit that the subject matter of claims 1 and 3 is not anticipated by Cheon et al. and the subject matter of claims 1 and 3 is not obvious over Cheon et al.

Claims 4 and 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the Cheon patent (US 6,783,569) as applied to claims 1-3 above, and further in view of the O'Connor patent (US 6,773,823). The Office Action stated that the Cheon patent discloses the claimed invention as discussed above. However Cheon teaches the core-shell formation by transmetalation reaction using an organic reducing agent (Cheon, col. 4, lines 11-13). O'Connor provides a coating method of gold on magnetic core using the same specific gold precursor and specific inorganic reducing agent as claimed. See O'Connor, col. 4, lines 6-12 and 56-65. Therefore, it would have been obvious to apply the specific gold precursor and reducing agent as taught by O'Connor in the core-shell formation of Cheon because O'Connor teaches that such method provides better stability for the shell layer (O'Connor, col. 2, lines 71-18).

Initially, applicants must strongly dispute the statement by the Patent Office that Cheon teaches the core-shell formation by transmetalation reaction using an organic reducing agent (Cheon, col. 4, lines 11-13). Nowhere at col. 4, lines 11-13 is a separate reducing agent taught or suggested as in the present claims 1 and 3, rather their process relies upon a transmetalation reaction. Further, applicants submit that neither Cheon nor O'Connor teach or suggest samarium, neodymium or samarium-cobalt as the magnetic nanoparticles. Further as Cheon specifically teaches against the need for a separate reducing agent, there would be no reason for combining the teachings of O'Connor wherein specific inorganic reducing agents are taught with Cheon. As claims 4 and 5 are dependent upon claim 1, and as claim 1 is submitted to be allowable over

Cheon for the reasons stated above, applicants submit that that the subject matter of claims 4 and 5 is not obvious over Cheon et al. in view of O'Conner. These arguments apply as well to newly added claims 17 and 18.

Claims 6-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the Cheon patent (US 6,783,569) alone, or as applied to claims 1-3 above, and further in view of the Zheng publication (2005/0208142). The Office Action stated that for claims 6-11, Cheon reports that the core-shell gold-coated particles are capable of binding with biomaterials through various chemical groups. See Cheon, col. 8, line 64 to col. 9, line 5. Further, it is well known in the art that metal nanoparticles, especially gold nanoparticles are stabilized with thio-end (i.e. mercapto terminated) groups, functionalized with amino, carboxylic acid groups, alcohols and glycols, and bound to biopolymer ligands through these functional groups. See the Zheng publication (2005/0208142), paragraphs [0004], [0005], [0074], [0075], and [0079]-[0083]. Therefore, the Office Action concluded that it would have been obvious to further functionalize the core-shell nanoparticles with various functional groups as claimed (and which are well known in the art as demonstrated in the Zheng publication) in order to facilitate their capability in binding to biomaterials as taught by Cheon.

Applicants submit that claims 6-11 are each dependent claims either directly or indirectly upon claim 1. These dependent claims will stand or fall with the independent claim from which they ultimately depend. This applies to newly added claim 19 as well.

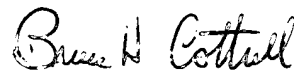
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References not relied upon are considered pertinent to the claimed invention.

In view of the foregoing amendments and remarks, claims 1, 3-11 and 17-19 are urged to be allowable over 35 U.S.C. 102 and 103. If the Examiner believes there are any unresolved issues despite this amendment, the Examiner is urged to contact the applicants' attorney undersigned below for a telephonic interview to resolve any such issue. A favorable action is solicited.

Respectfully submitted,

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